

# Annotated Yahtzee Game or Treatise

Played January 2015 using the Open Yahtzee program for Windows  
Annotated by John Mamoun. Public Domain, no copyright.

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Turn No.1, Roll No.1 (T1R1)

The screenshot shows the 'Open Yahtzee' window. At the top, there are 'Game' and 'Help' menus. The interface is divided into two main sections: 'Upper Section' and 'Lower Section'. The 'Upper Section' includes buttons for 'Aces', 'Twos', 'Threes', 'Fours', 'Fives', and 'Sixes', each followed by a score input field. Below these are fields for 'Total score:', 'Bonus:', and 'Total of upper section:'. The 'Lower Section' includes buttons for '3 of a kind', '4 of a kind', 'Full House', 'Sequence of 4', 'Sequence of 5', 'Yahtzee', and 'Chance', each followed by a score input field. Below these are fields for 'Yahtzee Bonus', 'Total of lower section:', and 'Grand Total:'. At the bottom, there are five dice icons showing 1, 2, 2, 1, and 2. Each die has a 'Keep' checkbox below it. To the right of the dice is a 'Roll! (2)' button.

T1R1 Commentary: The game of Yahtzee has been solved by computer scientists who used a computer to compute the best outcomes of the more than 1 trillion possible combinations in a Yahtzee game. This makes Yahtzee, with only  $10^{12}$  combinations, much simpler to solve compared to Backgammon, with  $10^{20}$  combinations, or Chess, with  $10^{54}$  combinations. There is a computer program on the internet that computes the optimal play for the game. So it is somewhat pointless to present this annotated game. The analyses presented in this game have not been verified by computer, so this could be like the blind leading the blind here. But might be useful to present some pointers.

In this opening dice roll, three 2's have been rolled. In general, if three of a number have been rolled as the first roll, those three should be kept, especially

if the category is blank in the Upper section for that number that occurs in triplicate. Keeping the three numbers gives the chance of getting a Yahtzee, 3 of a kind, Full House, and 4 of a kind. Here, the three numbers are 2's, which are generally too low in value to be used, at least in the early part of the game, for the 3 or a kind or 4 of a kind categories. However, they certainly can be used for the Twos category, and the Full House category (which has a fixed point value of 25 points) if two other identical numbers are rolled.

A player might be tempted to keep 2, 4, and 6 and try for a straight. However, both a 3 and a 5 would be needed to make a straight, and only a 5 straight can be made. There is a low probability of this happening, even over the next two turns. Generally, a player should only try for a 4-straight if the player gets three numbers in a sequence such as 2, 3, 4 or 3, 4, 5, where either one of two other numbers, added at either end of the sequence, would result in completion of the straight. However, in general, rather than keep 3 numbers in a row and try for the 4 and 5 straight, sometimes it is better to wait until the dice roll results in a lucky 4 numbers in a row, and then keep those numbers, which guarantee a 4 straight, and then spend the next turn trying for a 5 straight. The best way to make a 5 straight is to roll the numbers 2, 3, 4, 5 on the first roll, which guarantees a 4 straight, and then have two more rolls to get either a 1 or a 6, which will give the 5 straight. Rolling and keeping a 1, 2, 3, 4 or a 3, 4, 5, 6 is less likely to lead to a 5 straight, since only 1 number will provide the number needed to complete the straight. In general, if 2, 3, 4, 5 are rolled as the first roll, and the 5-straight category has not been filled, and especially if the 4 straight category has also not yet been filled, these numbers should be kept to spend the next two moves trying to get a 1 or 6 to complete the 5 straight.

Note as a general principle in Yahtzee, that to win the Bonus points of the Upper Section, the player must score a minimum total of 63 points for the upper section. This point total can occur if the player gets three of each number of the Upper Section category. It can also occur if the player gets slightly less than three of one number but slightly more than three of another number to compensate for having less of that one number, as long as the total for the Upper Section is 63 or more. The player must keep in mind that the par is to get a minimum of three of each number for each category in the Upper Section.

Open Yahtzee

Game Help

Upper Section

Aces

Twos

Threes

Fours

Fives

Sixes

Total score:

Bonus:

Total of upper section:

Lower Section

3 of a kind

4 of a kind

Full House

Sequence of 4

Sequence of 5

Yahtzee

Chance

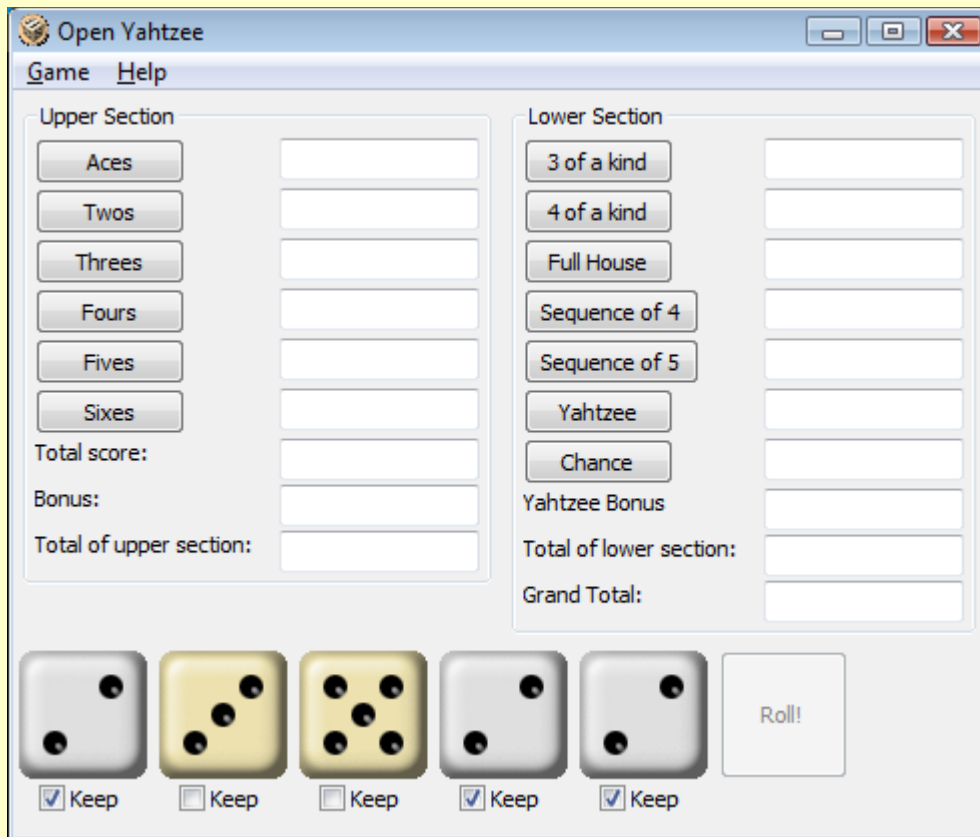
Yahtzee Bonus

Total of lower section:

Grand Total:

☒ Keep
 ☐ Keep
 ☐ Keep
 ☒ Keep
 ☒ Keep

T1R2 Commentary: Junk numbers. Keep nothing.



T1R3 Commentary: More junk numbers. This is the final roll of the turn or roll sequence. With three 2's, it is best to choose the Twos category. With three 2's, the minimum requirement, of 3 numbers for each category in the Upper Section, is met with respect to the 2's. All categories in this section need at least 3 of each number (Aces, Twos, Threes, Fours, Fives and Sixes) in order to win the 35 point Bonus.

The player should not choose the 3 of a kind category, however. This is because all five dice here add up to only 14. As a general guideline, the 3 of a kind and 4 of a kind categories should ideally only be chosen if the dice add up to a total of at least  $\frac{2}{3}$  of the maximum total possible with the five dice. The maximum possible total would be 30, if all dice were 6's, so preferably a total of at least 20 should be achieved before choosing either the 3 of a kind or 4 of a kind categories. It is relatively common to roll 3 numbers of a kind in Yahtzee, so it is appropriate to wait, especially in the early part of the game, until a high total 3 of a kind has been rolled. However, rolling 4 of a number is much rarer than rolling 3 of a number, so this  $\frac{2}{3}$  rule of thumb might not be as important to apply when deciding to choose 4 of a kind if 4 numbers have been rolled. Towards the later part of the game, if the 4 of a kind category has not been filled yet, because this category is difficult to fill, a player might be forced to take what the player can get and fill in the first 4 of a kind that the player finds, even if the dice combination adds up to less than 20.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes		Full House	
Fours		Sequence of 4	
Fives		Sequence of 5	
Sixes		Yahtzee	
Total score:	6	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	0
		Grand Total:	

					Roll! (2)
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	

T2R1 Commentary: The 2's category has been filled, so not much point in saving 2's. With two 3's on this roll, the two 3's are best saved. It is not ideal to keep low numbers like 2's or 3's in the opening game, but keeping 3's is the best possible move in this roll, given that the roll has given two 3's. These two 3's may lead to a third three, allowing the player to fill the Threes section with a minimum of three 3's, which maintains the possibility of winning the Upper Section Bonus.

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' has buttons for Aces, Twos, Threes, Fours, Fives, and Sixes. The 'Lower Section' has buttons for 3 of a kind, 4 of a kind, Full House, Sequence of 4, Sequence of 5, Yahtzee, and Chance. The 'Total score' is 6, and the 'Total of upper section' is empty. The 'Yahtzee Bonus' is empty, and the 'Total of lower section' is 0. The 'Grand Total' is empty. At the bottom, there are five dice icons: the first three are yellow (1, 2, 3) and the last two are white (4, 5). The 'Roll! (1)' button is highlighted with a blue dashed border.

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes		Full House	
Fours		Sequence of 4	
Fives		Sequence of 5	
Sixes		Yahtzee	
Total score:	6	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	0
		Grand Total:	

Roll! (1)

**T2R2 Commentary:** A third three has been rolled. This will be kept, securing the 3's category, with the chance of rolling another 3 next roll. A fourth 3 will allow the player to put four 3's in the Threes category. This extra three allows the player to use the Aces category as a safety category in case the player rolls a bad set of dice. This is because even if the player gets a zero for the Aces category, and loses three points in the Aces category as a result, the extra 3 points in the Threes category will allow the player to still be able to win the Upper Section Bonus if the player can get at least three of each number in the Fours, Fives and Sixes categories. It is probably not necessary or worth it this early in the game to use four 3's, if rolled, to fill in the 4 of a kind category. This is because a 4 of a kind with three 3's is not high enough in value to be worth scoring, although if the game was in the later stages, it may be worth it to score a low 4 of a kind due to there being fewer chances to fill this category. The advantage of having an extra 3 in the Upper Section, and converting the Aces category into a "safety" category that can be used if too many junk numbers are rolled, outweighs the advantage of scoring a low-value 4 of a kind.

Open Yahtzee

Game Help

Upper Section

Aces	
Twos	6
Threes	
Fours	
Fives	
Sixes	
Total score:	6
Bonus:	
Total of upper section:	

Lower Section

3 of a kind	
4 of a kind	
Full House	
Sequence of 4	
Sequence of 5	
Yahtzee	
Chance	
Yahtzee Bonus	
Total of lower section:	0
Grand Total:	

Roll!

☒ Keep ☒ Keep ☐ Keep ☒ Keep ☐ Keep

T2R3 Commentary: Junk numbers rolled. Threes selected.

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' includes buttons for Aces, Twos, Threes, Fours, Fives, and Sixes, with corresponding score boxes. The 'Lower Section' includes buttons for 3 of a kind, 4 of a kind, Full House, Sequence of 4, Sequence of 5, Yahtzee, and Chance, with corresponding score boxes. The 'Total score' is 15, and the 'Total of upper section' is 15. The 'Total of lower section' is 0. The 'Grand Total' is 0. At the bottom, five dice are shown with faces 1, 2, 3, 4, and 5. A 'Roll! (2)' button is highlighted with a blue dashed border.

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	
Fives		Sequence of 5	
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	0
		Grand Total:	

Roll! (2)

T3R1 Commentary: Lucky roll! A 5 straight given on the first roll. It is a big advantage to secure this rare category so early in the game. Generally, the 5 straight is difficult to get unless one rolls a 2, 3, 4, 5 on the first roll, and has two more rolls to try for the 1 and 6. It is also in general risky to try for the 5 straight, because if a player tries to get the 5 straight and fails, often the numbers left after three rolls are not optimal for selecting any category, so that those numbers would have to go into the Chance box or a safety box of some form. The 5 straight and a high-total 4 of a kind are the rarest categories to secure in Yahtzee, except of course for a Yahtzee itself, so it is a great advantage if a player can secure either of these categories early in the game. No point in rolling further at this point. Just select the category and move on.



The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' has buttons for Aces, Twos, Threes, Fours, Fives, and Sixes. The 'Lower Section' has buttons for 3 of a kind, 4 of a kind, Full House, Sequence of 4, Sequence of 5, Yahtzee, and Chance. The current roll of five dice is 2, 3, 4, 2, 4. The 'Total score' is 15, and the 'Total of upper section' is 15. The 'Total of lower section' is 40, and the 'Grand Total' is 55. The 'Roll! (2)' button is highlighted.

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	40
		Grand Total:	55

Roll! (2)

T4R1 Commentary: The only numbers that are duplicated are the 2's, however, the Twos category is already filled, and there is little point in trying for a low-value 3 of a kind or 4 of a kind. However, this first roll provides a 2, 3, 4 sequence, which is an open-ended 3-in-a-row sequence. That is, a player can complete a 4 straight by rolling either 1 on one end, or a 5 on the other end. There will be two rolls to get either a 1 or a 5, so it is worth it to keep the 2, 3, 4 and try for the 4 straight. As a general rule of thumb, it is ideal to have at least one category in the Lower Section filled for each category filled in the Upper section. Here, only one category, the 5 straight, is filled in the Lower section, while two categories are filled in the Upper Section, so we are one behind.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	40
		Grand Total:	

					Roll! (1)
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	

T4R2 Commentary: Two 3's have been rolled. If the Threes category had not been filled, it might be tempting to keep those three 3's, since they guarantee filling out the Threes category with with three 3's. However, the Threes category has been filled, so the player will not keep the two additional threes and will continue to try to get the 4 straight. There is not much point to get a 3 or a kind, since the 3 of a kind would be a relatively low dice total if the three numbers consist of 3's.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	40
		Grand Total:	

					Roll!
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	


T4R3 Commentary: Luckily, a 1 was rolled, so the Sequence of 4 or 4 straight category can be chosen. Note that in general there is a much higher chance of rolling a 4 straight than rolling a 5 straight.


**Open Yahtzee**


Game Help


Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	70
		Grand Total:	


  

  
☐ Keep

  
☐ Keep

  
☐ Keep

  
☐ Keep

  
☐ Keep

Roll! (2)

T5R1 Commentary: This first roll provided a 4 straight, but the 4 straight category is already completed. With 5 different numbers, the best thing to do is to keep the 6. Keeping the highest number, a 6, provides some chance of getting two more 6's, which can allow filling in the Sixes category,

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	70
		Grand Total:	

					Roll! (1)
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	

T5R2 Commentary: Junk numbers.

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' has buttons for Aces, Twos, Threes, Fours, Fives, and Sixes. The 'Lower Section' has buttons for 3 of a kind, 4 of a kind, Full House, Sequence of 4, Sequence of 5, Yahtzee, and Chance. The current scores are: Aces (empty), Twos (6), Threes (9), Fours (empty), Fives (empty), Sixes (empty), Total score (15), Bonus (empty), Total of upper section (empty), 3 of a kind (empty), 4 of a kind (empty), Full House (empty), Sequence of 4 (30), Sequence of 5 (40), Yahtzee (empty), Chance (empty), Yahtzee Bonus (empty), Total of lower section (70), and Grand Total (empty). At the bottom, there are five dice showing 1, 2, 1, 4, and 6, with 'Keep' checkboxes below them. A 'Roll!' button is on the right.

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	70
		Grand Total:	

Roll!

☐ Keep ☒ Keep ☐ Keep ☐ Keep ☒ Keep

5R3 Commentary: More junk numbers. Two 1's were rolled, and the player could choose the Aces category, but would lose 1 point in the Aces category compared to obtaining a pair of three 1's for that category. Losing that 1 point in the Aces category would force having four 4's, 5's, or 6's in the other Upper Section categories in order to get the Bonus. There would be a low chance of this happening, given that the 4 of a kind category is also not filled. The player would then need two four-of-a-kinds, one of which would need to be either a 4, 5, or 6 four-of-kind. It is better not to use the Aces category given this potential complication. Instead, the Chance category was chosen, with a total of 17 for the category, which is slightly less than 2/3 of the maximum 30 points that can be obtained for this category. This is not ideal, but then again the player must do the best possible with a bad roll of the dice.

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' has buttons for Aces, Twos, Threes, Fours, Fives, and Sixes. The 'Lower Section' has buttons for 3 of a kind, 4 of a kind, Full House, Sequence of 4, Sequence of 5, Yahtzee, and Chance. The current dice roll is 6, 6, 1, 4, 2. The 'Total score' is 15, and the 'Total of upper section' is empty. The 'Total of lower section' is 87, and the 'Grand Total' is empty. The 'Roll! (2)' button is visible.

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	87
		Grand Total:	

Roll! (2)

T6R1 Commentary: The first roll gives two 6's. Keeping the 6's gives the opportunity to fill out the Sixes category, or to obtain a high-value 3 of a kind or 4 of a kind. The other three numbers are not useful, given that the Sequence or straight categories have already been filled. However, even if the Sequence categories were not filled, it is inefficient to try for a straight by starting with numbers that have gaps in the middle of the sequence of those numbers, as opposed to starting with a group of numbers where a number at either end of that group would complete the straight. Here, 1, 3, 4 would require a 2 to make a straight. The next two rolls would rely on getting that one number, but if the sequence was, for example, 2, 3, 4, then either a 1 or a 5 would complete the straight, which is much more likely to occur than if only a 2 could complete the straight. But anyhow, the sequence categories have been filled.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	87
		Grand Total:	

					Roll! (1)
<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	

T6R2 Commentary: Junk numbers.



**Open Yahtzee**

Game Help

**Upper Section**

Aces	
Twos	6
Threes	9
Fours	
Fives	
Sixes	
Total score:	15
Bonus:	
Total of upper section:	

**Lower Section**

3 of a kind	
4 of a kind	
Full House	
Sequence of 4	30
Sequence of 5	40
Yahtzee	
Chance	17
Yahtzee Bonus	
Total of lower section:	87
Grand Total:	

Roll!

☒ Keep ☒ Keep ☐ Keep ☐ Keep ☐ Keep

T6R3 Commentary: More junk numbers. The dice do not form a category. There are two options: Use the Yahtzee category as a safety category and score a zero for the Yahtzee, since it is rare to get a Yahtzee and probably not much is lost by making it a zero. Or, choose the Aces category and score one point in the Aces category. This results in loss of two points for the Aces category, since a minimum of three of each number in the Upper Section should ideally be put in those categories. Also, if the Aces category is trashed with just 1 point, the player will lose the 35 point Bonus for the Upper Section, unless the player can get 4 of either 4's, 5's or 6's to make up for the loss of the two points in the Aces section. There is a low probability of the player accomplishing this, and the player still needs another 4 of a kind to fill in the 4 of a kind category. It is probably better to trash the Yahtzee category and lose the theoretically possible 50 points of that category, with a tiny chance of getting that Yahtzee, instead of trashing the Aces category and probably losing the 35 point Bonus for the Upper Section. There is a better chance of getting at least three of each number in the Upper Section for the remaining numbers, and getting the 35 point bonus, rather than trying to keep the Yahtzee category and miraculously getting a Yahtzee over the next remaining rolls.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	87
		Grand Total:	

					Roll! (2)
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	

T7R1 Commentary: With two 5's and two 3's, it might be tempting to keep the 5's and 3's and try for a Full House. However, if another 5 or 3 is not rolled, the resulting dice combination will not be placeable in a good payout category. Meanwhile, the player is under pressure to fill in several categories (Fours, Fives, Sixes, Aces, 3 of a kind and 4 of a kind) that require three of the same number, and the player is running out of turns to accomplish this. Here, with two 5's, the player has the beginning of three or more of the same number, with the number being a 5, which allows filling in a high-value 3 of a kind, 4 of a kind, or Fives category in the Upper Section. It was decided to keep the two 5's and discard the other numbers.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	87
		Grand Total:	

					Roll! (1)
<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	

T7R2 Commentary: Lucky roll! Two more 5's have been added. This allows choosing a high-value 4 of a kind, or to fill the Fives category with four 5's, which creates an excess of five points above the required minimum of 15 points in the Fives category (if one wants to win the Bonus). This extra five points would allow the Aces category to become a safety category, that the player can score a zero in and still be able to get the Bonus, if the player can get three 4's in the Fours category and three 6's in the Sixes category. The fourth number here rolled is a 3. If it was higher than three, the player might just end the turn here and choose a category. If the player is trying for the 4 of a kind category, the player might want to roll again and try to get a higher number than 3.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	87
		Grand Total:	

					Roll!
<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input type="checkbox"/> Keep	

T7R3 Commentary: The player has rolled a 6. This allows a player to fill the 4 of a kind category with 26 points, which is very high considering that the maximum point value is 30. It is better to choose the 4 of a kind category rather than the Fives category. This is because the game is in its later stages, and 4 of a kind is perhaps the rarest category, particularly a high-value 4 of a kind. Better to take the points of the 4 of a kind category now, rather than fill the Fives and hope that another 4 of a kind will appear again, which is unlikely. Also, the player can easily get some points in the Fives category, even if the player does not get at least three 5's. However, with the 4 of a kind, it is all or nothing, all four numbers or no category score. There is generally a pretty good chance of getting the minimum three 5's needed to get the par for the 5's category that is needed to get the Bonus.

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' contains buttons for Aces, Twos, Threes, Fours, Fives, and Sixes, with corresponding score boxes. The 'Lower Section' contains buttons for 3 of a kind, 4 of a kind, Full House, Sequence of 4, Sequence of 5, Yahtzee, and Chance, with corresponding score boxes. The 'Total score' is 15. The 'Total of upper section' is 15. The 'Total of lower section' is 113. The 'Grand Total' is 128. At the bottom, five dice are shown with faces 4, 6, 4, 1, and 1. A 'Roll! (2)' button is highlighted.

Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	128


Roll! (2)


T8R1 Commentary: The only number for which two examples are provided in this first roll is the number 1. The player might keep the two 1's and try for three 1's, and this may be the best decision. However, in general, the 1 category is a low-scoring category, and it is not worth it in general to score the 3 of a kind category with three 1's as the 3 of a kind number. Meanwhile, the game is getting late, and the player is under pressure to start filling out the high-value Fours, Fives and Sixes categories, and to fill in a high-scoring 3 of a kind category, and may lose many points if the player runs out of turns before filling in these categories. So the player decided to keep a 4 and try for the Fours category. The player decided not to keep the 6 because the player decided that with only one 6 with this roll, there is a chance that the player might not be able to get another two 6's to get a high-score for the Sixes or 3 of a kind category. If the player keeps the 4 and winds up with less than three 4's, the player only loses 4-8 points, instead of 6-12 points if the player does not do well with the 6's category. The player is hedging his bet by choosing a 4 instead of the 6, because the player stands to lose more by losing with a 4 compared to a 6, and it is risky to try to get either three 4's or three 6's, because the first roll only provides one example of a 4 or a 6. The player could keep the 1's to try for a Full House, although there is a relatively low chance of getting the exact numbers needed for the Full House category. Unfortunately, there is nothing too good about this first dice roll, and the player just decided on the wimpy decision to keep the 4.


Open Yahtzee


Game Help


Upper Section		Lower Section	
Aces		3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	


☒ Keep


☐ Keep


☐ Keep


☐ Keep


☐ Keep

Roll! (1)

T8R2 Commentary: Junk numbers. A 5 straight has been given by the roll, but both straights categories have been filled.

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' has the following scores: Aces (1), Twos (6), Threes (9), Fours (0), Fives (0), and Sixes (0). The 'Lower Section' has the following scores: 3 of a kind (0), 4 of a kind (26), Full House (0), Sequence of 4 (30), Sequence of 5 (40), Yahtzee (0), and Chance (17). The 'Total score' is 15. The 'Total of upper section' is 15. The 'Total of lower section' is 113. The 'Grand Total' is 128. At the bottom, there are five dice showing 4, 1, 2, 4, and 1. The 'Roll!' button is visible.

Upper Section		Lower Section	
Aces	1	3 of a kind	0
Twos	6	4 of a kind	26
Threes	9	Full House	0
Fours	0	Sequence of 4	30
Fives	0	Sequence of 5	40
Sixes	0	Yahtzee	0
Total score:	15	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:	15	Total of lower section:	113
		Grand Total:	128

Dice: 4, 1, 2, 4, 1

Roll!






T8R3 Commentary: Only one more 4 has been rolled. Filling in the Fours category will result in loss of 4 points (given that a minimum of three 4's should ideally be scored for the Fours category) and almost certain loss of the Bonus for the Upper Section. The other option is to trash the Aces category, by getting only 1 point for that category. This would result in loss of 2 points for the Aces category, compared to the ideal of getting 3 points for the Aces category, and this is less than losing 4 points if the Fours category was filled, and losing only 2 points also gives some chance of being able to get the Bonus for the Upper Section if four 4's, 5's, or 6's are eventually rolled. In hindsight, the two 1's that were rolled in the first roll of this turn should have been kept, given that in hindsight the player was forced to use the Aces category and only puts one 1 in the Aces category. Hindsight is 20/20, of course.

**Open Yahtzee**

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	16	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

☐ Keep
 ☐ Keep
 ☐ Keep
 ☐ Keep
 ☐ Keep

T9R1 Commentary: Two 5's are rolled, and 5 is the only number coming in two or more on this roll, so the 5 will be kept, which will give the chance of getting a high Fives score, or a high-value 3-of-a-kind.



**Open Yahtzee**

Game Help

Upper Section

Aces 1

Twos 6

Threes 9

Fours

Fives

Sixes

Total score: 16

Bonus:

Total of upper section:

Lower Section

3 of a kind

4 of a kind 26

Full House

Sequence of 4 30

Sequence of 5 40







Yahtzee 0

Chance 17

Yahtzee Bonus

Total of lower section: 113

Grand Total:

☐ Keep
☐ Keep
☐ Keep
☒ Keep
☒ Keep

T9R2 Commentary: Luckily, two more 5's have been rolled.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
Fours		Sequence of 4	30
Fives		Sequence of 5	40
Sixes		Yahtzee	0
Total score:	16	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

					Roll!
<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	

T9R3 Commentary: Another 5 has been rolled! Too bad the Yahtzee category was zeroed out previously. With 5 fives, a 3 of a kind, Full House or Fives can be chosen. The player chose the Fives category, since this results in an excess of 10 points for this category, over a par of three 5's for the Fives category. This excess of 10 points makes up for the loss of 2 points in the Aces category, which results in a net of 8 extra points. These 8 extra points can be used to allow the player to still get the Bonus even if the player only puts one 4 in the Fours category, or only puts two 6's in the Sixes category. This gives the player some flexibility to be able to try for the more difficult 3 of a kind or Full House categories, and if this attempt fails, to be able to fill in a less-than-par Fours or Sixes category and still have some chance of getting the Bonus for the Upper Section.

The screenshot shows the 'Open Yahtzee' game window. The title bar includes 'Open Yahtzee' and standard window controls. Below the title bar are 'Game' and 'Help' menus. The main area is divided into two sections: 'Upper Section' and 'Lower Section'.

**Upper Section:**

Aces	1
Twos	6
Threes	9
<b>Fours</b>	
Fives	25
Sixes	
Total score:	41
Bonus:	
Total of upper section:	

**Lower Section:**

3 of a kind	
4 of a kind	26
Full House	
Sequence of 4	30
Sequence of 5	40
Yahtzee	0
Chance	17
Yahtzee Bonus	
Total of lower section:	113
Grand Total:	

At the bottom, there are five dice showing 3, 3, 6, 6, and 6. Each die has a 'Keep' checkbox below it. To the right of the dice is a 'Roll! (2)' button.


T10R1 Commentary: Two 3's and two 6's have been rolled. The player may be tempted to keep the 3's and 6's and try for a Full House. There is a  $\frac{1}{3}$  chance per turn of rolling either a 3 or a 6 to complete the Full House, giving a chance of  $\frac{2}{3}$  or 66% over the next two turns of getting the Full House. The player could also score the Sixes category with two 6's and still have some chance of getting the Bonus for the Upper Section, thanks to the extra 5's in the Fives category. However, with two 6's rolled, it may be better to save the 6's and try for a high-value 3 of a kind, or the Sixes category. The player is running out of chances to make a Sixes category with a minimum of 3 sixes, and this roll also presents a rare opportunity that the player may not get again in this game to get a high-value 3 of a kind. The player decided to save the 6's.


**Open Yahtzee** [Minimize] [Maximize] [Close]


Game Help


Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
<b>Fours</b>		Sequence of 4	30
Fives	25	Sequence of 5	40
<b>Sixes</b>		Yahtzee	0
Total score:	41	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	


  

  
☐ Keep

  
☐ Keep

  
☒ Keep

  
☐ Keep

  
☒ Keep

Roll! (1)

T10R2 Commentary: Junk numbers!

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
<b>Fours</b>		Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	41	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

					Roll!
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	


T10R3 Commentary: More junk numbers. Here, there are two 4's, and two 6's. The player decided to choose the Fours category, since it only loses 4 points compared to if the player chose the Sixes category, which would lose 6 points. The player has only 4 points excess in the Upper Section from the extra 5's from previously, so the player will need three 6's to get the Bonus in the Upper section. The player will concentrate on keeping 6's in the next rolls.


**Open Yahtzee**


Game Help


Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	


  


☐ Keep


☐ Keep


☒ Keep


☐ Keep


☐ Keep

T11R1 Commentary: Here, the player decided to keep the 6 to try to get three 6's. On the next roll (not shown), there were no more 6's, but two 3's were rolled, while the other numbers were junk numbers. The player decided to discard the 6 and keep the 3's, to try for a low-value 3 of a kind with 3's being the triplicated number.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

					Roll!
<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	

T11R3 Commentary: Junk numbers! The player has no category to fill, so the player decided to trash the Full House category, which is probably the least likely category for the player to fill, given that the player has only two more rolls left, compared to filling the Sixes or 3 of a kind category. The Full House is rarer, and more difficult to roll, than the 3 of a kind, because the Full House is a specific kind of "3 of a kind," in that it is a 3 of a kind that is also combined with a 2 of a kind. It is sometimes better for a player to wait for a Full House to appear by luck, rather than try for a Full House by trying to get a third number after rolling doubles of two other numbers on one roll.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	0
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

					Roll! (2)
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input type="checkbox"/> Keep	

T12R1 Commentary: The player has only two more categories left: Sixes and 3 of a kind, and only two turns left to make them. The basic strategy here is to work with the highest numbers that come in two or more on the first roll. Here, there are two 2's and two 4's. Of these choices, the two 4's would obviously make the highest-total 3 of a kind. The 4's are kept.









**Open Yahtzee**

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	0
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

☐ Keep
 ☐ Keep
 ☒ Keep
 ☒ Keep
 ☐ Keep

T12R2 Commentary: Junk numbers.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	
Twos	6	4 of a kind	26
Threes	9	Full House	0
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	113
		Grand Total:	

					Roll!
<input type="checkbox"/> Keep	<input type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	<input checked="" type="checkbox"/> Keep	





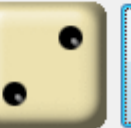
T12R3 Commentary: A third 4 has been rolled. The player selected 3 of a kind, with the 4 being the triplicated number. The dice total is 17, slightly less than the ideal suggested minimum of 20 points for the 3 of a kind category.

Open Yahtzee

Game Help

Upper Section		Lower Section	
Aces	1	3 of a kind	17
Twos	6	4 of a kind	26
Threes	9	Full House	0
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	130
		Grand Total:	

☐ Keep
 ☐ Keep
 ☐ Keep
 ☐ Keep
 ☐ Keep


T13R1 Commentary: Junk numbers! Only the Sixes category is left, so the player only wants to roll and keep sixes.


Open Yahtzee


Game Help


Upper Section		Lower Section	
Aces	1	3 of a kind	17
Twos	6	4 of a kind	26
Threes	9	Full House	0
Fours	8	Sequence of 4	30
Fives	25	Sequence of 5	40
Sixes		Yahtzee	0
Total score:	49	Chance	17
Bonus:		Yahtzee Bonus	
Total of upper section:		Total of lower section:	130
		Grand Total:	

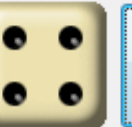
  


☐ Keep


☐ Keep


☐ Keep


☐ Keep


☐ Keep

T13R2 Commentary: More junk! Where are the 6's?

The screenshot shows the 'Open Yahtzee' game window. The 'Upper Section' includes categories: Aces (1), Twos (6), Threes (9), Fours (8), Fives (25), Sixes (0), Total score: (49), Bonus: (0), and Total of upper section: (49). The 'Lower Section' includes: 3 of a kind (17), 4 of a kind (26), Full House (0), Sequence of 4 (30), Sequence of 5 (40), Yahtzee (0), Chance (17), Yahtzee Bonus (empty), Total of lower section: (130), and Grand Total: (179). At the bottom, five dice are shown with faces 4, 5, 1, 3, and 4. Each die has a 'Keep' checkbox below it. A 'Roll! (3)' button is to the right of the dice.

T13R3 Commentary: Junk strikes again! No 6's! The player must get a zero for the Sixes category and lose the Bonus for the Upper Section. The Grand Total for this game is 179.

### **How this PDF File was Created**

The player played a Yahtzee game using the Windows version of the freeware Open Yahtzee program. Each turn consisted of three dice rolls. After each dice roll, a screen capture was performed so that only the active open window of the game was captured, using the Windows command Alt-PrintScreen. Each screen shot was then pasted into an Open Office Writer text file. About 39 screen shots were taken, one for each dice roll of the entire game (actually, one screen shot was inadvertently left out, giving 38 total screen shots). Screen shots were taken of the freeware Open Yahtzee program because if screenshots were taken of a proprietary Yahtzee game, that might have resulted in a copyright violation. Technically, using these screenshots from a proprietary program to make an annotated file may be considered Fair Use, but it was better not to take the risk of being sued for copyright infringement. The screen shots were then annotated. Once the annotated file was completed, the Open Office word processor file was converted into a PDF file, using the Export as PDF option in the Open Office Writer program. This PDF file was then loaded into the freeware Adobe Acrobat PDF reader to make sure that no graphics were cut off in the formatting of the PDF document.